Amendment to the Specification:

Please amend the paragraph that begins on page 2, line 36, to read as follows:

In conventional gamma cameras, the contributions of the scintillation crystal and photomultiplier tubes to the energy resolution of the camera are greater than that of the ~~ACD~~ ADC shift error, so the ADC shift error does not have a significant effect on the overall resolution. However, as the energy resolution of these components improves, the ADC shift error is making a more significant contribution to the overall resolution.

Please amend the paragraph that begins on page 3, line 7, to read as follows:

The amount of variation in the energy distribution (energy resolution) is typically identified by the full width at half maximum (FWHM) of the distribution. For a normal distribution, FWHM relates to the standard deviation of the distribution and is generally calculated by multiplying the standard deviation by $2x\ (2x\ln\ (2))^{1/2}$ (approximately 2.35). Roughly, it corresponds to the amount of additional error in the pulse, above that of a theoretical pulse with no intrinsic variation (a pure spike), by virtue of the ~~ACD~~ ADC shift error. The extent to which the ADC shift error increases the FWHM is determined by the pulse shape and the sample frequency of the ADC. For example, for a given pulse shape, an integration period (the time between samples) of 20 ns and 5 samples, a FWHM of about 25% may be obtained. This drops to 13%> when the integration period is reduced to 16 ns and to 5% when an integration period of 10 ns is used. Further reductions to about 1.5% are achieved by increasing the number of samples from 5 to 8, at the 10 ns integration period.

Please amend the paragraph that begins on page 5, line 30, to read as follows:

One advantage of at least one embodiment of the present invention is that the effect of ~~ACD~~ ADC shift error on pulse integration is reduced.

Please amend the paragraph that begins on page 7, line 15, to read as follows:

A processor **22** receives the sampled digital pulse energy values, S_1, S_2, S_3, . . . S_5 from the ADC. The processor performs an integration of the samples to obtain an uncorrected value for the total energy of the pulse e. g., $S_1 + S_2 + S_3 + S_4 + S_5$. The processor uses a subset of these samples to create a code which correlates with a relationship between the samples in the subset. For example, a plurality of selected consecutive samples e.g., S_1, S_2, and S_3 is selected to form the subset. The samples in the subset are preferably selected to encompass a portion of the energy distribution in which the energy is changing rapidly, preferably spanning the peak energy $\mathbf{P_e}$. The processor **22** accesses a correction algorithm table **24** to obtain a correction factor related to the code. The correction factor is then applied to the integrated value of the energy (e.g., the two are multiplied) to generate a corrected energy value. The effect of ~~ACD~~ ADC shift error on the resulting integrated energies is thereby eliminated or reduced.

Please amend the paragraph that begins on page 13, line 31, to read as follows:

In addition to correcting the integration of the energy, the correction table is also optionally used to determine the start time of the pulse. Knowing the code value, the corresponding ~~ACD~~ ADC shift can be read from the table. By subtraction of the ~~ACD~~ ADC shift from the actual time at which the first sample was taken, the time at which the pulse commenced is determined. Creating a time stamp for the pulse in this way finds application, for example, in positron emission tomography (PET) systems, to create a time to digital conversion.

Please amend the paragraph that begins on page 14, line 24, to read as follows:

Subsets comprising the first three samples S_1, S_2, S_3 are used from each ~~ACD~~ ADC shift error to generate a code. Specifically, the S_1, S_2, S_3 values are normalized to the maximum value at each shift error. For example, the maximum

value for the zero shift error set $S_4 = 0.894791$. Thus, the normalized value of S_3 is $0.865768/0.894791 = 0.967564$. Each of the normalized values is then multiplied by a common factor: 15 in the present example. Thus, for the example given, $15 \times 0.967564 = 14.51$. This is rounded down to the nearest integer = 14, which is equivalent to the 4 bit code 1110.